Duc Charles-Théodore, car Son existence était une leçon pour les hommes d'un rang élevé qui se contentent de vivre et de jouir ; elle en était une également pour les humbles en leur apprenant de quelle façon il faut comprendre la vraie fraternité. Mais elle enseignait aussi à la jeunesse moderne, si rarement soucieuse de sa propre dignité, comment on traverse la vie dans toute la fière simplicité qui ne veut rien devoir à personne.

Et pour terminer cette existence admirable, le Duc Charles-Théodore, par l'expression formelle d'une dernière volonté, a maintenu jusqu'à l'ensevelissement de Sa dépouille, la simplicité de toute Sa vie : le concours des personnalités impériales et royales déjà accourues à Munich, celui de l'armée auquel Sa qualité royale lui donnait droit, celui des municipalités de la Bavière où sans doute il n'existe pas un village qui ne Lui ait envoyé des malades, celui de six mille opérés qui Lui doivent la vue, toutes les manifestations capables de flatter la vanité humaine furent écartées doucement ; et jeudi dernier Son cercueil descendit, en présence de la famille seule, dans le caveau princier.

Cependant jamais funérailles ne furent plus grandioses, car tout un peuple était consterné devant la perte irréparable qu'il venait de faire.

NOTES.

WE learn from the *Times* of January 3 that the will of the late Dr. Ludwig Mond directs his trustees, on the death of Mrs. Mond, to set aside two sums of 50,000*l.* each, free of duty, one to be payable to the Royal Society and the other to the University of Heidelberg. The will provides that the income of the 50,000*l.* bequeathed to the Royal Society "is to be employed in the endowment of research in natural science, more particularly, but not exclusively, in chemistry and physics, by providing rewards for new discoveries and pecuniary assistance (including scholarships) to persons pursuing scientific investigations, and in supplying apparatus and appliances for laboratories and observatories, and, so far as consistent with the Mortmain and Charitable Uses Act, 1888, or other similar provisions, in improving existing or in erecting new laboratories and observatories, and in such other manner as the Royal Society shall decide to be best calculated to promote scientific research, and also in providing, so far and in such amounts as the council of the Royal Society shall from time to time determine, for the publication and circulation of the reports and papers communicated to the said society, and for the preparation and publication of catalogues and indexes of scientific literature which the Royal Society may have undertaken or may in future undertake." Similar conditions govern the bequest to the University of Heidelberg. Dr. Mond also left three sums, each of 20,000*l.*, one for the authorities of the Akademie der bildenden Kunste at Munich, to be applied for the promotion of the arts of sculpture and painting; a second for providing pensions or occasional pecuniary assistance to aged or disabled workmen of Messrs. Brunner, Mond and Co., Ltd., or their successors, in the works at Northwich, Sandbach, and elsewhere; the third for the municipal authorities of Cassel.

SIR JAMES DEWAR, F.R.S., has been elected a foreign member of the Reale Accademia dei Lincei (Academy of Sciences) of Rome, in the section of physical, mathematical, and natural sciences. The King of Italy has signified his approval of this election.

M. ÉMILE PICARD, vice-president of the Paris Academy of Sciences, has been elected president for 1910, and is succeeded by M. Armand Gautier as vice-president.

THE death is announced of Mr. W. Earl Hodgson, author of books on "Trout-fishing," "Salmon-fishing," and other works on fishing and popular natural history.

WE notice with regret the death, on January 1, of Sir Edward L. Williams, in his eighty-second year. Sir Edward Williams was well known as the designer of the Manchester Ship Canal, which took twelve years to construct. He acted as chief engineer during the work of construction and on the completion of the canal in 1894 was knighted by Queen Victoria.

THE annual general meeting of the Institute of Metals will be held at the Institution of Mechanical Engineers, Westminster, on Tuesday and Wednesday, January 18 and 19. The new president of the institute, Sir Gerald Muntz, Bart., will deliver his presidential address on the former day.

IT was announced by the president of the Chemical Society at the last meeting that in view of the completion of fifty years' fellowship by the past presidents Sir Henry Roscoe, Sir William Crookes, Dr. Hugo Müller, and Dr. A. Vernon Harcourt, the council has resolved to entertain these fellows as guests of the society at a dinner to be held some time at the end of May or beginning of June.

THE following appointments have been made to the Indian Agricultural Service:—imperial agricultural bacteriologist, Mr. C. M. Hutchinson; supernumerary mycologist, Mr. F. J. F. Shaw; supernumerary agriculturist, Mr. G. R. Hilson. The two posts of assistant superintendent recently vacant in the natural history section of the Indian Museum, Calcutta, have been filled by the selection of Mr. Stanley W. Kemp and Mr. F. H. Gravely.

WE offer our congratulations to the *Chemical News*, which has just completed the fiftieth year of its existence and its hundredth volume. The Chemists' Club of New York and the American Chemical Society have sent Sir William Crookes messages of congratulation on the jubilee anniversary of his editorship of the journal, and the former institution has elected him an honorary member in recognition of his services to the science of chemistry.

THE Geneva correspondent of the *Times* states that the Swiss Federal Government has decided to send a scientific expedition into the unexplored parts of Bolivia under the leadership of Prof. O. Fuhrmann, of the University of Neuchâtel. The explorers will leave Switzerland for South America on July 1, and their object will be to study the fauna, flora, and climate of the country. It is stated that several English and American men of science are to join the expedition at their expense.

ON Tuesday, January 18, Prof. W. A. Herdman, F.R.S., will commence a course of three lectures at the Royal Institution on "The Cultivation of the Sea," and on Thursday, January 20, the Rev. C. H. W. Johns will deliver the first of two lectures on "Assyriology." The Friday evening discourse on January 21 will be delivered by Sir James Dewar, F.R.S., on "Light Reactions at Low Temperatures," and on February 4 by Prof. W. Bateson, F.R.S., on "The Heredity of Sex."

THE death is announced, in his sixty-eighth year, of Dr. Charles B. Dudley. For a short time after his graduation at Yale he was an assistant in the department of physics at the University of Pennsylvania. Since 1875 he had been the chief chemist to the Pennsylvania Railroad Company, in which capacity he made important investigations relating to the composition of steel rails and of the lubricating oils used on railways. He was president of the American Chemical Society from 1896 to 1898. From 1902 to 1908 he was president of the American Society for

Testing Materials, and was recently elected president of the international society of a similar name.

Through the kindness of Mr. and Mrs. Wickham Boynton, the collection of birds formed by the late Sir Henry Boynton, which for many years has been exhibited in the large room at Burton Agnes Hall, has been placed in the Municipal Museum at Hull. As all ornithologists are aware, Sir Henry's collection of birds, principally obtained by his own gun, was one of unusual interest and importance, and contains many great rarities. There are above 200 cases in all, and besides being valuable by reason of the scarcity of the specimens, the collection is interesting from the fact that in many cases both sexes of birds are represented, and in some instances there are also the young. Each case has been exceedingly well set up, and the whole forms a collection such as is rarely seen together. In addition to this, the Hull Museum has also recently acquired the collection of birds (about seventy cases) formed by Mr. Riley Fortune. This collection consists principally of Yorkshire specimens, and fortunately serves well to fill in the gaps in Sir Henry Boynton's collection. These, together with the Pease collection already in the museum, will enable the authorities at Hull to have a display of birds such as will be difficult to surpass in any northern museum.

The President of the Local Government Board has appointed Dr. Eastwood, one of the pathologists of the Royal Commission on Tuberculosis, an additional medical inspector of the Board, with the special view of his undertaking pathological investigations. Provision also has been made for the necessary assistance and laboratories. The immediate object will be to apply to public health work the important results obtained by the Royal Commission on Tuberculosis, and thereby to ensure the freedom of important foods from the infection of this disease. It is intended also to investigate the similar problems which are constantly arising in connection with other infectious diseases. These investigations will be concerned chiefly with current doubtful points in regard to disease. The new work thus inaugurated by Mr. Burns will include inquiry as to the pathological methods of diagnosis of disease already utilised in the public health work of many sanitary authorities. It is expected that by interchange of information good work will be encouraged and extended, and that coordination and standardisation of the bacteriological methods of diagnosis of disease will be secured.

The weekly returns of the Registrar-General show that in 1909, taking the returns for the fifty-two weeks ending with Christmas Day, the total deaths in London were 70,988. This is 3883 fewer deaths than the average for the previous five years, but it is 2353 more than in 1908, which, so far, is the healthiest year on record; the year which has just closed is, however, the second healthiest on record. The deaths in London for the respective quarters were 23,761, 16,917, 13,727, and 16,583; the rates per annum for every 1000 persons living were, for the respective quarters, 19·7, 14·0, 11·4, and 13·8. For the urban districts represented by the seventy-six great towns of England and Wales, the death-rates for the several quarters were 18·8, 14·5, 11·9, and 14·1.

We have received a copy of a paper by Messrs. H. B. Torrey and F. L. Kleeberger, issued in the zoological series of the University of California Publications, on three new species of the actinarian genus Cerianthus from southern California.

We have to acknowledge the receipt of a copy of the report of the Clifton College Scientific Society for 1908–9, this being the first printed report issued by that body for the last two-and-twenty years. The resumption of the issue will, it is hoped, enable members to keep more readily in touch with the work of sections other than those in which they are specially interested.

To the first part of *Sitzungsberichte der Niederrhein. Ges. f. Natur- und Heilkunde in Bonn* for 1909, Prof. G. Steinmann contributes an illustrated paper on the problem of ammonite-phylogeny, as exemplified, in this instance, by the genus Heterotissotia. It is concluded that, in place of being a member of the "Circumnodosi" group, Heterotissotia is really related to the Triassic Ceratites, of which it is to be regarded as the Cretaceous descendant. Accordingly, the original view of von Buchs as to the existence of Cretaceous as well as Triassic Ceratites is maintained by the author to be valid.

In *Prometheus* of December 8, 1909, Drs. P. and E. von Hass, in the course of an article on the origin of the upright posture in man, assert that the ancestors of the human race used their canines for tearing the hide and flesh of the animals on which they fed (how these animals were killed is not explained), but that when they learnt to employ mussel-shells or flint-flakes for this purpose, their tusks, as being no longer necessary, rapidly degenerated. On the other hand, in a recent article in the *Daily Telegraph*, Sir E. R. Lankester has expressly stated that ancestral man never used his tusks for rending flesh. Whom are we to believe?

In the issue of the *Yorkshire Weekly Post* for December 18, 1909, the natural history correspondent refers again to the killing of birds for the sake of ascertaining whether they have been ringed, quoting as instances a heron shot in Cheshire and a black-headed gull in Lancashire. The heron, he remarks, is protected in Cheshire, as in most other counties, so that the slaughter was illegal as well as unnecessary. In the case of a robin ringed at Glasgow, and picked up dead at the same place a few months later, he asks if there is any use in the ringing of such birds.

From the evidence of actual specimens and information obtained by Mr. Rothschild from his agents in California, Mr. Lydekker announces in the *Field* of December 25, 1909, that the so-called Californian elephant-seal to which Gill applied the name *Macrorhinus angustirostris* appears to be identical with *M. leoninus*, as typified by the specimens obtained by Lord Anson on Juan Fernandez, and named by Linnæus. The seals formerly inhabiting Guadalupe Island and the Californian coast are stated to migrate southwards after the breeding-season, and probably cross the equator. *M. leoninus* is characterised by the comparatively long snout of the old bulls, whereas in the Falkland, Crozet, and Macquarie sea-elephants, hitherto identified with *leoninus*, this appendage is shorter. These southern sea-elephants should be known as *Macrorhinus falclandicus* or *patagonicus*, unless the earlier Morunga, or its original and still more barbarous form Mirounga, be preferred.

The vascular anatomy of mammals forms the subject of the two articles in the November (1909) issue of the *Anatomical Record*, Messrs. Schulte and Tilney discussing in the first the means by which the venous blood is returned to the heart, with especial reference to the iliac veins, while in the second Mr. C. B. Coulter describes the early stages in the development of the aortic arches in the cat, more particularly with regard to the existence of a fifth arch.

The existence in mammals of such a fifth arch, lying between the seismic and pulmonic arches, has recently formed the subject of several papers. This fifth arch appears to be a vessel rising from the aortic bulb and discharging into the pulmonic arch near its junction with the dorsal aorta. It attains fullest development in man and the mole, in both of which it is generally complete, but in the cat and the pig the full arch is rarely formed, while in the rabbit its condition is still more rudimentary.

A LARGE portion of vol. iii., part ii., of the Transactions of the Natural History Society of Northumberland, Durham, and Newcastle is taken up by papers on polypod Arthropoda, Canon Norman and Prof. Brady furnishing a synopsis of the local crustaceans, while Dr. A. R. Jackson comments on rare arachnids obtained in 1908, and the Rev. J. E. Hull contributes notes on spiders. Special interest attaches, however, to the description, by Mr. E. L. Gill, of a new Carboniferous arachnid from the Tyne Valley. This valuable specimen, which was obtained from the Coal-measures of Crawcrook, is evidently related to *Anthracosiro woodwardi*; the two forms agreeing in the general structure of the abdominal region. Whereas, however, the typical species has limbs of a normal type, those of the Crawcrook specimen are curiously expanded and flattened—so much so, indeed, that, unless this peculiar contour admits of some other explanation, it is evident that we have to do with a new species. It has accordingly been named *Anthracosiro latipes*, with the proviso that it may eventually be found advisable to change the generic title.

WRITING in the December (1909) number of the *Zoologist*, Mr. H. St. J. K. Donisthorpe claims to be the fourth naturalist who has witnessed in this country a slave-raid on the part of a colony of *Formica sanguinea*. The incident occurred at Bewdley, and the colony raided belonged to *F. fusca*. At the nest of the latter, the narrator states that "Many workers [of *sanguinea*], laden with pupæ, were streaming off in the direction of their home. . . . Others were attacking and killing solitary *fusca* workers. Several *fusca* workers were observed up the grass-stems, &c., holding pupæ, and endeavouring to escape from the slave-raiders. I watched these proceedings for a considerable time, and accompanied some of the ants with pupæ back to their nest, quite a distance off, though they covered the ground very quickly." In the same nest Mr. Donisthorpe took two "gyandromorph" *sanguiniae*, the one being, both in colour and structure, male on the right side and worker on the left, and the other male on the left and female on the right. Only two other specimens of such abnormal ants, neither referable to *sanguinea*, appear to have been previously observed in Great Britain.

As a large portion of the December (1909) issue of the *Journal of Economic Biology* is taken up by a list of literature and the proceedings of the Association of Economic Biologists, the articles are reduced to two. One of these, by Mr. S. A. Neave, who has recently returned from a prolonged tour in northern Rhodesia, Katanga, and the Congo Free State, relates to the distribution of the species of tsetse known as *Glossina palpalis*. The author remarks that the great Congo-Zambezi watershed forms a delimitation between two quite distinct faunas. On descending from this plateau into the Zambezi basin a fauna of the southern type is encountered, whereas at the same elevation on the Congo declivity the area of the western tropical fauna is entered. Now, so far as is known, *G. palpalis* occurs only on the Congo side, and its distribution coincides with that of the tropical fauna generally. Further, the extent of the range of the species within the tropical area is dependent upon station, the insect first meeting the traveller as he descends from the plateau in the well-wooded, damp gorges cut by the rivers and streams.

CIRCULAR No. 112 of the Bureau of Entomology of the United States describes very fully the Mediterranean flour-moth, and the damage and loss it causes to the milling industry. The pest was first noticed in 1892 infesting several Californian flour-mills, and since then it has gradually spread until at the present day it occurs in practically all the principal milling centres and in most of the States. On attaining full growth the caterpillar forms a new web, which becomes a cocoon wherein it undergoes transformation to pupa, and it is in this stage that the insect does most damage. The infested flour becomes caked, clogging the machinery and necessitating frequent and prolonged stoppage resulting in some cases in the loss of thousands of dollars. The remedy suggested is treatment with hydrocyanic acid; the methods of carrying out this rather delicate and dangerous fumigation, and the subsequent cleaning of the mill, are fully given.

THE Imperial Department of the West Indies has issued a pamphlet on the grafting of cacao, by Mr. Joseph Jones, curator of the Botanic Station, Dominica. It is shown that propagation by grafting gives better results than propagation by seed, inasmuch as the desirable characters of any particular tree, such as character of bean, prolific bearing, early bearing, and resistance to disease, &c., can be reproduced with tolerable certainty. Indeed, in no other way can the planter ensure absolute uniformity of bean, one of the most important features in the improvement of the quality of the crop. Grafted trees always develop into a low, spreading form, and this is of special advantage in picking the pods and also in affording protection from the wind. Full instructions for grafting are given, and the process is shown to be neither difficult nor expensive. Another pamphlet explains how to erect and work cotton gins, and is intended for workmen in regular charge of ginneries and for those who have to erect gins without any previous experience with this class of machinery.

THE "cotton-boll weevil"—a beetle of the genus Anthonomus, to which our own "apple-blossom weevil" belongs —causes in the United States an annual loss estimated at 25 millions of dollars. A vast economic literature has grown up around this insect, the latest contribution being an exhaustive account, by W. E. Hinds and W. W. Yothers, of its methods of hibernation (Entom. Bull., No. 77, U.S. Dept. Agric., 1909). The species is carried over the winter by adult beetles sheltering in various situations—many in old bolls that remain on the cotton-stalks. Only a small proportion of the individuals that commence to hibernate survive until the spring, so that the wintering period affords the most vulnerable stage in the insect's life-history, and detailed information respecting it cannot fail to be of value to the planters who seek some practicable means for destroying the weevils.

THE Year-book of the United States Department of Agriculture for 1908 contains some interesting short articles on the economic importance of vertebrates, written by naturalists attached to the Biological Survey. Mr. F. E. L. Beal discusses the relations between birds and insects, and argues that insectivorous birds are beneficial even though they destroy a large number of predaceous and parasitic insects, since the vegetable-eating insects that are present in any year in abnormally large numbers must form the larger proportion of the birds' food. Mr. A. K. Fisher writes on the economic value of predaceous birds and mammals. He believes that coyotes, foxes, weasels, and skunks are, on the whole, beneficial, and that the most dangerous enemies to poultry are domestic cats. Mr. D. E. Lantz describes the various poisons used for destroying noxious mammals such as wolves, gophers, and prairie marmots, and recommends strychnia-sulphate for general use. This poison is also advocated for campaigns on a large scale against voles by Mr. S. E. Piper, who contributes a paper on "mouse plagues," voles being usually known as "meadow-mice" or "short-tailed field-mice" by American farmers and naturalists.

THE Indian peasant, says the *Pioneer Mail*, usually looks with suspicion upon any scientific innovation which the Government may introduce for his benefit, and it speaks much for the efficacy of the expedient if it eventually overcomes his stubborn prejudices. Such success has attended the inoculation of cattle with rinderpest anti-serum prepared at the bacteriological laboratory of the Civil Veterinary Department. At first great opposition was experienced to the use of the serum, but since it has curtailed outbreaks of a malady which probably creates more havoc than any other cattle disease in India, and has prevented heavy mortality amongst animals, it has been much in demand, and it is now common for cattle owners in infected localities to pay for inoculators to be sent. It is expected that the demand for the serum will increase each year, and the Ceylon Government and many native States desire to be provided with it. The supply is, however, limited. During the year 1908–9 every endeavour was made at the bacteriological laboratory to prepare as large an amount as possible, but about eighty thousand more doses were required than were manufactured.

THE Selborne Society has just issued a new illustrated leaflet entitled "How to Attract Wild Birds." It is a reprint of an article written by the honorary secretary, Mr. Wilfred Mark Webb, for the *Country Home*, and deals with the methods employed in the Brent Valley Bird Sanctuary. A number of photographs which have been used to embellish it were taken in the Bird Sanctuary, and show the construction of the nesting-boxes, the ways of fixing them, the heights at which they should be placed, as well as the open trays which have also been successfully introduced.

IN *Travel and Exploration* for January Mr. P. L. Faulkner gives an account of the Khasia Hills, "a little-known district of the Indian Empire." His description is popular and interesting, but it is curious that he seems to be unacquainted with the valuable official monograph on the Khasi tribe by Major P. R. Gurdon, published by the Government of Eastern Bengal in 1907. By its aid he would have been able to explain the fact, to him mysterious, why a flat stone is placed before the trilithons which the Khasis erect in honour of deceased persons held in respect by the tribe.

IN the December (1909) issue of *Man* Major P. M. Sykes describes the system of tattooing in vogue in Persia. Until the last generation the practice was universal. Now it is rare among persons of rank, and is confined to the lower classes, especially in southern Persia. It seems to be partly ornamental, partly prophylactic. Women use it to avert the evil eye, to hide a scar or other blemish, or to cure disease. As usual, the trade is in the hands of Gypsy women; and though it prevails in Arabia, among the better-class Mussulmans in Persia it is now regarded as a relic of barbarism.

IN *Man* for December (1909) Mr. W. J. Lewis Abbott discusses the so-called "Pygmy" flint weapons. He gives a graphic sketch of the race which erected the Kitchen Middens at Hastings, and is disposed to associate the habit of making these implements with the Continental troglodytes who, he supposes, migrated north to Britain and southwards to the Mediterranean, Egypt, and India. This theory of primitive race migrations obviously involves many difficulties, and it is quite within the bounds of probability that this type of implement may have been independently evolved from more than one centre of origin. The geological evidence collected by Dr. Colley March in Lancashire is believed to show that they belong to an age far more remote than any deposit in which polished stone implements have been hitherto found.

IN the Journal of the Royal Society of Arts for December 17, 1909 (vol. lviii., pp. 101–29), Mr. Hugh Pearson gives a popular account of the diamond fields of Brazil, including the history of the industry since the first discovery of diamonds in 1729, brief descriptions of the geology of the different areas, and the methods of working the deposits. Details are furnished of the curious process of burning out the surface flaws by means of potassium nitrate. The loss in weight is about 8 per cent. There is an excellent general map showing the relative positions of the diamond fields, as well as local maps on a larger scale.

THE constant σ of Stefan's law—the energy radiated by a black body at temperature T° absolute $=\sigma T^4$—has generally been assumed to have the value $5{\cdot}32\times10^{-12}$, as deduced by Dr. Kurlbaum from his observations. M. Féry's recent observations give, however, $6{\cdot}3\times10^{-12}$. Owing to this disagreement MM. Bauer and Moulin have made a re-determination of the constant by heating a platinum strip *in vacuo* until the radiation from it was equal in amount to that from a perfectly black body at the melting point of gold (1064°). The electrical energy given to the strip was then measured. They deduce as the value of σ to within 1 per cent. $6{\cdot}0\times10^{-12}$, and are disposed to question the accuracy of Prof. Planck's expression for the energy of each wave-length sent out by a black body at any temperature. An account of the work is contained in the *résumé* of communications made to the Société française de Physique at the meeting on December 3, 1909.

THE *Physical Review* for December (1909) contains an abstract of a paper on a new modification of the cloud method of measuring the elementary electrical charge, and the most probable value of that charge, read by Prof. R. A. Millikan to the American Physical Society at its Princeton meeting in October. He observes single isolated drops having multiple charges, first when gravity is balanced by a vertical electric field and the drops are stationary, then when the drops fall under gravity, the field having been withdrawn. The mean value deduced from observations of drops composed of water and of alcohol, and having from two to six elementary charges, is $4{\cdot}65\times10^{-10}$, with a possible error of 2 per cent. This number is in close agreement with the values obtained by Prof. Planck and by Prof. Rutherford and Dr. Geiger by other methods, but differs widely from those obtained previously by Sir J. J. Thomson, Prof. Townsend, and Prof. H. A. Wilson.

IN the U.S. Geological Survey's Bulletin No. 401, 1909, Mr. George F. Becker discusses the origin of petroleum and other natural hydrocarbons, with numerous references to authorities. He considers it proved that some oils are of organic, others of inorganic, origin. So far, however, as any direct evidence goes, "the great petroleum pools . . . may have been derived from carbonaceous matter of vegetable or animal origin . . . (or) from carbides of iron or other metals." The possibility of the latter origin led Mr. Becker to consult Dr. L. A. Bauer's map of magnetic declination in the United States. This he reproduces, marking on it where petroleum exists, and concludes:—"What the map does prove is that petroleum is intimately associated with magnetic disturbances similar to those arising from the neighbourhood of minerals possessing sensible magnetic attraction. . . . Henceforth no geological theory of petroleum will be acceptable which does not explain this association." Mr. Becker's conclusions, if confirmed, promise a new and important sphere of usefulness for magnetic surveys.

THE Patents and Designs Act, 1907, forms the subject of an article, by Mr. George Schuster, in the December (1909) number of the *Economic Journal.* Mr. Schuster deals mainly with the effect which the Act has had upon the practice pursued by some foreigners of taking out British patents for the purpose, not of working them in the United Kingdom, but of preventing them being worked there. He states that there has not been any petition for revocation under Sec. 27 in which the revocation would have led to the establishment of an important industry in the United Kingdom, and points out that this fact, when considered in conjunction with the other evidence, affords conclusive proof that the original evil was greatly exaggerated, and accordingly that the hopes of benefits to be felt on its removal could not in any case have been realised. This conclusion justifies the note of warning given in NATURE for July 23, 1908, immediately before Sec. 27 came into operation, in the following words:—"Much has been written lately as to the benefits to this country likely to be produced by this section, and in some cases there has been considerable exaggeration of the probable effects."

PROF. R. H. SMITH contributes an article on a new formula for the total heat of steam in the *Engineer* for December 24, 1909. Prof. Smith has been led to analyse the law of total heat algebraically in consequence of the publication of a new set of tables compiled by Prof. L. S. Marks and Mr. H. N. Davis, of Harvard University. These tables are consistent between their different columns, and also seem to give data really trustworthy for comparatively strict accuracy. The formula, which represents with complete accuracy the figures of the new table throughout the whole range from 70° F. to 500° F., is as follows:—

Total heat from 32° F. of saturated steam:

$$H = 1826 + t - \frac{1,250,000}{1620 - t}.$$

The author gives an abbreviated table for comparison of the tabular numbers given by Marks with the results as calculated by the new formula; the comparison shows very close agreement, excepting for temperatures below 60° F. and above 500° F. It will, of course, be remembered that it is very difficult to make accurate heat experiments on very low-pressure steam, and also that no trustworthy experimental data as yet exists for temperatures above 400° F., the tabular numbers given by Marks having been extrapolated.

IN the note on Mr. Knocker's address on the arrangement of ethnological collections in provincial museums in NATURE of December 16, 1909 (p. 198), the word *geographical* should have been *non-geographical.*

MESSRS. WILLIAMS AND NORGATE will publish almost immediately "Beet-sugar Making and its Chemical Control," by Mr. Y. Nikaido. The author has endeavoured to explain, not only the practical operations of sugar-house stations, but also the fundamental principles involved in the various processes of the sugar house and in the methods for analysis of various sugar-house products.

MESSRS. W. AND G. FOYLE, 135 Charing Cross Road, London, W.C., have just issued a new edition of a classified catalogue of scientific and technical books. The catalogue contains a selection of books which can be supplied both new and second-hand, and, so far as it goes, it should prove of service to students seeking books on particular subjects.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JANUARY:—

Jan. 7. 5h. Venus at greatest brilliancy.
,, 9h. Saturn at quadrature to the Sun.
8. 14h. Neptune at opposition to the Sun.
10. 1h. Mercury at greatest elongation, 19° 2′ E. of the Sun.
11. 0h. 14m. Uranus in conjunction with the Moon (Uranus 3° 9′ N.).
,, 18h. Uranus in conjunction with the Sun.
12. 9h. 12m. Mercury in conjunction with the Moon (Mercury 4° 33′ N.).
13. 15h. 22m. Venus in conjunction with the Moon (Venus 7° 43′ N.).
16. 12h. Mercury stationary.
17. 3h. 45m. Saturn in conjunction with the Moon (Saturn 1° 34′ N.).
,, 16h. Mars at quadrature to the Sun.
,, 19h. 19m. Mars in conjunction with the Moon (Mars 4° 25′ N.).
20. 2h. Venus stationary.
23. 16h. 5m. Neptune in conjunction with the Moon (Neptune 4° 5′ S.).
29. 21h. Jupiter stationary.
30. 12h. 5m. Jupiter in conjunction with the Moon (Jupiter 2° 45′ S.).

HALLEY'S COMET.—The following is an extract from the corrected ephemeris for Halley's comet published by Mr. Crommelin in No. 4379 of the *Astronomische Nachrichten*:—

Ephemeris for Greenwich Noon.

1910		R.A. h. m.		Decl. ° ′		log *r*		log Δ
Jan. 5	...	2 4·6	...	+10 56	...	0·2984	...	0·1568
10	...	1 49·4	...	+10 15	...	—	...	0·1704
15	...	1 36·2	...	+ 9 39	...	0·2664	...	0·1851
20	...	1 24·7	...	+ 9 9	...	—	...	0·2001
25	...	1 14·9	...	+ 8 45	...	0·2310	...	0·2147
30	...	1 6·4	...	+ 8 27	...	—	...	0·2284

Thus we see the comet is about to pass from Aries into Pisces, and may be observed, with a sufficiently powerful instrument, at any time during the evening before midnight.

Observations made at Utrecht on November 8, 13, 17, 19, and 21, 1909, by Drs. Nijland and J. v. d. Bilt, indicated the increase of brightness shown by the following magnitudes:—13·5, 13·0, 12·8, 12·8, and 12·7.

ELEMENTS AND EPHEMERIS FOR DANIEL'S COMET, 1909*e*.—In No. 4379 of the *Astronomische Nachrichten* Dr. Ebell gives a set of new elements and an ephemeris for Daniel's comet, 1909*e*. From these we learn that perihelion passage occurred on 1909 November 27·6694 (M.T. Berlin), and that the comet is now but little more than half as bright as it was at the time of discovery. Its position for